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EXAMINER

OLANIRAN, FATIMAT O

ART UNIT

PAPER NUMBER

2615

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

|                              |  |                                       |  |
|------------------------------|--|---------------------------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/542,031   | <b>Applicant(s)</b><br>VELICAN ET AL. |  |
|                              | <b>Examiner</b><br>FATIMAT O. OLANIRAN | <b>Art Unit</b><br>2615               |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-74 is/are pending in the application.
- 4a) Of the above claim(s) 1-38 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 39-74 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 July 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. ____.                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>7/13/2005</u> .   | 6) <input type="checkbox"/> Other: ____.                          |

## **DETAILED ACTION**

### ***Claim Objections***

1. Claims 39 and 57 are objected to because of the following informalities: Claim 39, lines 7 and 8, "...rate of rise of said response...such that said response...".

Claim 39, line 13, "...equalizing said rising response..."

According to claim 39 lines 6, the antecedent basis of "said response" and "said rising response" is "a rising acoustic response". For purposes of clarity all limitations must have clear and consistent antecedent basis. The limitations of claim 39 correspond to claim 57.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 39-46, 50-53, 57-64, 69-71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Macaulay (GB2254221) in view of Nieuwendijk et al (5261006).

Claim 39, Macaulay disclose a loudspeaker system suitable for a confined space including (abstract):

an electro-acoustic transducer having a relatively low value of  $Q_t$  (page 4 line 6), wherein  $Q_t$  denotes total quality factor of resonant behavior of said electro-acoustic

Art Unit: 2615

transducer, including electrical and mechanical quality factors; (inherent to Q of a speaker which is electro-mechanical)

an enclosure for said electro-acoustic transducer (page 4 line 6-7) said enclosure having a second order topology which is naturally inclined to produce a rising acoustic response for said system at a second order rate (page 2 line 16-18 and page 4 line 10-11), said enclosure further having means adapted to interface said confined space for modifying a rate of rise of said response relative to said second order rate (page 4 line 8) said interface means being further arranged to filter harmonics out of said acoustic response to reduce distortion (page 3 line 14-16); and means included in an electrical path driving said electro-acoustic transducer for equalizing said rising response to be substantially flat extended dynamic headroom at least at selected frequency or frequencies (page 5 line 1-4)

Macaulay does not explicitly disclose such that said response is attenuated relative to said second order rate. However Macaulay discloses a second order rate (page 4 line 18) and extending the low frequency response (page 1 line 3-4). It would be obvious to one of ordinary skill in the art that extending a frequency response involves attenuating the slope or order rate of the gain with respect to frequency.

Macaulay does not explicitly disclose but is accentuated relative to a substantially flat response within a substantial part of a passband of said system, said accentuation being most significant at a selected frequency or frequencies near a high end of said passband.

Art Unit: 2615

Nieuwendijk discloses is accentuated relative to a substantially flat response within a substantial part of a passband of said system, said accentuation being most significant at a selected frequency or frequencies near a high end of said passband (Fig. 6c and col. 4 line 49-55).

Therefore it would be obvious to one of ordinary skill in the art at the time the invention was made that to modify the design of Macaulay with the frequency analysis of Nieuwendijk in order to determine frequency range resulting from different quality factors.

Claim 40 analyzed with respect to claim 39, Macaulay discloses a loudspeaker system according to claim 39 wherein said second order rate is substantially 12dB/octave (page 4 line 18).

Macaulay does not explicitly disclose and said attenuated response is not more than substantially 9dB/octave.

However, the attenuated response modifies the frequency range and Macaulay discloses modifying the frequency range (page 1, line 3-4). Therefore it would be obvious to one of ordinary skill in the art at the time the invention was made that the degree of attenuation is determined by design considerations in order to achieve a desired bass response from a speaker.

Claim 41, analyzed with respect to claim 39, Macaulay does not explicitly disclose wherein said attenuated response is substantially 6dB/octave.

However, the attenuated response modifies the frequency range and Macaulay discloses modifying the frequency range (page 1, line 3-4). Therefore it would be obvious to one of ordinary skill in the art at the time the invention was made that the degree of attenuation is determined by design considerations in order to achieve a desired bass response from a speaker.

Claim 42 analyzed with respect to claim 39, Macaulay discloses wherein said interface means includes a first acoustic filter (page 4 line 8).

Claim 43 analyzed with respect to claim 39, 42, Macaulay discloses wherein said first acoustic filter includes a Helmholtz resonator (page 4 line 8).

Claim 44 analyzed with respect to claims 39, Macaulay in view of Nieuwendijk disclose wherein said selected frequency or frequencies is/are near a higher frequency end of said passband (Nieuwendijk; Fig. 6c and col. 4 line 50-51)

Claim 45 analyzed with respect to claim 39, Macaulay in view of Nieuwendijk disclose wherein said enclosure includes backwave barrier means adapted to exclude from said

Art Unit: 2615

confined space sound generated from a side of said transducer opposing said space (Macaulay Fig. 1 element 1).

Claim 46 analyzed with respect to claim 45 and 39, Macaulay in view of Nieuwendijk disclose wherein said backwave barrier means includes an acoustically leaky element (Macaulay Fig. 1 element 1 and 2).

Claim 50 analyzed with respect to claim 45-46, 39, Macaulay in view of Nieuwendijk disclose wherein said leaky element causes at least partial sound field cancellation outside of said confined space (Macaulay page 5 lines 16-21).

Claim 51 analyzed with respect to claim 39, Macaulay in view of Nieuwendijk disclose wherein said equalizing means is adapted to attenuate said rising response at least at said selected frequency or frequencies (Macaulay; page 5 lines 10-20).

Claim 52 with respect to claim 39, Macaulay in view of Nieuwendijk do not explicitly disclose wherein said equalizing means includes a two pole filter.

However Nieuwendijk discloses a filter (col. 4 lines 52-55) and Macaulay discloses equalizing filters (page 5 line 1-2).

Therefore it would be obvious to one of ordinary skill in the art at the time the invention was made that the design preference would determine the type of filter used in order to obtain a desired frequency range.

Art Unit: 2615

Claim 53 analyzed with respect to claim 39, Macaulay disclose wherein such equalizing means is included with an inverter amplifier combination used for driving said electro-acoustic transducer (Fig. 3 and page 5 line 1-4).

Claim 57, Macaulay disclose a method of extending output of a loudspeaker system suitable for a confined space, said method including (abstract):

providing an electro-acoustic transducer having a relatively low value of  $Q_t$ , (page 4 line 6), wherein  $Q_t$  denotes total quality factor of resonant behavior of said electro-acoustic transducer including electrical and mechanical quality factors (inherent to  $Q$  of a speaker which is electro-mechanical);

providing an enclosure for said electro-acoustic transducer (page 4 line 6-7), said enclosure having a second order topology which is naturally inclined to produce a rising acoustic response for said system at a second order rate (page 2 line 16-18 and page 4 line 10-11);

interfacing said enclosure to said confined space to modify said rising response relative to said second order rate (page 4 line 8) said interfacing being further arranged to filter harmonics out of said acoustic response to reduce distortion (page 3 line 14-16); and electrically equalizing said rising response to be substantially flat overall and to provide extended dynamic headroom at least at said selected frequency or frequencies (page 5 line 1-4).

Macaulay does not explicitly disclose such that said response is attenuated relative to said second order rate



Art Unit: 2615

However Macaulay discloses a second order rate (page 4 line 18) and extending the low frequency response (page 1 line 3-4). It would be obvious to one of ordinary skill in the art that extending a frequency response involves attenuating the slope or order rate of the gain with respect to frequency.

Macaulay does not explicitly disclose but is accentuated relative to a substantially flat response within a substantial part of a passband of said system, said accentuation being most significant at a selected frequency or frequencies near a high end of said passband,

Nieuwendijk discloses is accentuated relative to a substantially flat response within a substantial part of a passband of said system, said accentuation being most significant at a selected frequency or frequencies near a high end of said passband (Fig. 6c and col. 4 line 49-55).

Therefore it would be obvious to one of ordinary skill in the art at the time the invention was made that to modify the design of Macaulay with the frequency analysis of Nieuwendijk in order to determine frequency range resulting from different quality factors.

Claim 58 analyzed with respect to claim 57 Macaulay discloses wherein said second order rate is substantially 12dB/octave (page 4 line 18).

Macaulay does not explicitly disclose and said attenuated response is not more than substantially 9dB/octave.

Art Unit: 2615

However, the attenuated response modifies the frequency range and Macaulay discloses modifying the frequency range (page 1, line 3-4). Therefore it would be obvious to one of ordinary skill in the art at the time the invention was made that the degree of attenuation is determined by design considerations in order to achieve a desired bass response from a speaker.

Claim 59 analyzed with respect to claim 57 Macaulay does not explicitly disclose wherein said attenuated response is substantially 6dB/octave.

However, the attenuated response modifies the frequency range and Macaulay discloses modifying the frequency range (page 1, line 3-4). Therefore it would be obvious to one of ordinary skill in the art at the time the invention was made that the degree of attenuation is determined by design considerations in order to achieve a desired bass response from a speaker.

Claim 60 analyzed with respect to claim 57, Macaulay discloses wherein said interfacing is performed via a first acoustic filter (page 4 line 8).

Claim 61 analyzed with respect to claim 60, 57 Macaulay discloses wherein said first acoustic filter includes a Helmholtz resonator (page 4 line 8).

Claim 62 analyzed with respect to claim 57 Macaulay in view of Nieuwendijk discloses wherein said selected frequency or frequencies is/are near a higher frequency end of said passband (Nieuwendijk; Fig. 6c and col. 4 line 50-51).

Claim 63 analyzed with respect to claim 57, Macaulay in view of Nieuwendijk disclose wherein said enclosure includes backwave barrier means adapted to exclude from said confined space sound generated from a side of said transducer opposing said space (Macaulay Fig. 1 element 1).

Claim 64 analyzed with respect to claims 57, 63 Macaulay in view of Nieuwendijk disclose wherein said backwave barrier means includes an acoustically leaky element (Macaulay Fig. 1 element 1 and 2).

Claim 68 analyzed with respect to claims 64, 63, 57 Macaulay in view of Nieuwendijk disclose including utilizing said leaky element to at least partially cancel a sound field attributable to said system that is external to said confined space (Macaulay page 5 lines 16-21).

Art Unit: 2615

Claim 69 analyzed with respect to claim 57 Macaulay in view of Nieuwendijk disclose wherein said equalizing is adapted to attenuate said rising response at least at said selected frequency or frequencies (Macaulay; page 5 lines 10-20).

Claim 70 analyzed with respect to claim 57 Macaulay in view of Nieuwendijk do not explicitly disclose wherein said equalizing is performed via a two pole filter.

However Nieuwendijk discloses a filter (col. 4 lines 52-55) and Macaulay discloses equalizing filters (page 5 lines 1-2).

Therefore it would be obvious to one of ordinary skill in the art at the time the invention was made that the design preference would determine the type of filter used in order to obtain a desired frequency range.

Claim 71 analyzed with respect to claim 57, Macaulay in view of Nieuwendijk disclose wherein such equalizing is performed by means included with an inverter amplifier combination used for driving said electro-acoustic transducer (Macaulay; Fig. 3 and page 5 line 1-4).

Art Unit: 2615

4. Claim 47-49, 54-56, 65-67, 72-74 are rejected under 35 U.S.C. 103(a) as being unpatentable over Macaulay (GB2254221) in view of Nieuwendijk et al (5261006) in further view of Croft III (6389146).

Claim 47 analyzed with respect to claims 45 and 39 Macaulay in view of Nieuwendijk do not disclose wherein said backwave barrier means includes a sealed or acoustically leaky cavity built into a motor vehicle.

Croft discloses wherein said backwave barrier means includes a sealed or acoustically leaky cavity built into a motor vehicle (col. 11 line 1-7).

Therefore it would be obvious to one of ordinary skill in the art at the time of the invention to modify the system of Macaulay with the enclosure of Croft in order to provide a desired audio output for a particular confined space.

Claim 48 analyzed with respect to claims 45, 47 and 39, Macaulay in view of Nieuwendijk and Croft discloses wherein said backwave barrier means includes a wall of a trunk of said vehicle (Croft; col. 11 line 1-7).

Claim 49 analyzed with respect to claims 47, 45, 39 Croft does not explicitly disclose wherein said backwave barrier means includes a rear parcel shelf of said vehicle.

However Croft discloses mounting in a car trunk (Fig. 13 col. 11 lines 1-7).

Therefore it would be obvious to one of ordinary skill in the art at the time the invention was made that the placement of the speaker would be determined by design preference and desired sound output.

Claim 54 analyzed with respect to claims 39, 42, Macaulay in view of Nieuwendijk disclose wherein said first acoustic filter interacts with a first side of said electro-acoustic transducer (Macaulay Fig. 1 and page 1 line 1-8).

Macaulay in view of Nieuwendijk do not disclose a second acoustic filter adapted to interact with a second side of said electro-acoustic transducer opposing said first side.

Croft discloses a second acoustic filter adapted to interact with a second side of said electro-acoustic transducer opposing said first side (Fig. 11 and col. 10 line 38-46).

Therefore it would be obvious to one of ordinary skill in the art at the time of the invention to modify the system of Macaulay with the filters of Croft in order to obtain a desired frequency range output.

Claim 55 analyzed with respect to claim 54, 42, 39, Macaulay in view of Nieuwendijk and Croft disclose wherein said second acoustic filter is adapted to modify phase and/or amplitude of a backwave generated by said electro-acoustic transducer (Croft Fig. 11 and col. 10 lines 38-46).

Claim 56 analyzed with respect to claim 54, 42, 39 Macaulay in view of Nieuwendijk and Croft disclose wherein said second acoustic-filter is adapted to enhance cancellation of a sound field attributable to said system that is external to said space (Croft; col.11 line 8-27, also inherent to function of filter).

Art Unit: 2615

Claim 65 analyzed with respect to claims 57, 63 Macaulay in view of Nieuwendijk do not disclose wherein said backwave barrier means includes a sealed or acoustically leaky cavity built into a motor vehicle,

Croft discloses wherein said backwave barrier means includes a sealed or acoustically leaky cavity built into a motor vehicle (col. 11 line 1-7).

Therefore it would be obvious to one of ordinary skill in the art at the time of the invention to modify the system of Macaulay with the enclosure of Croft in order to provide a desired audio output for a particular confined space.

Claim 66 analyzed with respect to claim 65, 63, 57, Macaulay in view of Nieuwendijk and Croft discloses wherein said backwave barrier means includes a wall of a trunk of said vehicle (Croft; col. 11 line 1-7).

Claim 67 analyzed with respect to claim 57, 63, 65 Croft does not explicitly disclose wherein said backwave barrier means includes a rear parcel shelf of said vehicle.

However Croft discloses mounting in a car trunk (Fig. 13 col. 11 lines 1-7).

Therefore it would be obvious to one of ordinary skill in the art at the time the invention was made that the placement of the speaker would be determined by design preference and desired sound output.

Art Unit: 2615

Claim 72 analyzed with respect to claim 57, 60 Macaulay in view of Nieuwendijk disclose wherein said first acoustic filter interacts with a first side of said electro-acoustic transducer (Macaulay Fig. 1 and page 1 line 1-8).

Croft discloses a second acoustic filter adapted to interact with a second side of said electro-acoustic transducer opposing said first side (Fig. 11 and col. 10 line 38-46).

Therefore it would be obvious to one of ordinary skill in the art at the time of the invention to modify the system of Macaulay with the filters of Croft in order to obtain a desired frequency range output.

Claim 73 analyzed with respect to claims 72, 60, 57 Macaulay in view of Nieuwendijk and Croft disclose wherein said second acoustic filter is adapted to modify phase and/or amplitude of a backwave generated by said electro-acoustic transducer (Croft Fig. 11 and col. 10 lines 38-46).

Claim 74 analyzed with respect to claim 72, 60, 57 Macaulay in view of Nieuwendijk and Croft disclose wherein said second acoustic-filter is adapted to enhance cancellation of a sound field attributable to said system that is external to said space (Croft; col.11 line 8-27, and Macaulay page 5 lines 16-21).



***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to FATIMAT O. OLANIRAN whose telephone number is (571)270-3437. The examiner can normally be reached on M-F 10:00-6 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on 571-272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

FO

/Vivian Chin/  
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